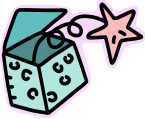



2009 Virginia Environmental Education Conference  
**Out of the Box**  
 Techniques and Programming

# Hands on Field Trip

*When the **whole** is greater than the sum of its parts.*

VCE-York County, 4-H Environmental Programs

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## WHO ARE WE?

**Teresa Bennett**  
**Barbara Dunbar**  
**Jody Turner**


- ❖ Parents of public school students
- ❖  Master Gardeners

## COMMON GROUND

- Afterschool environmental clubs
- York County elementary schools
- Schoolyard learning gardens



## COMBINING FORCES

- WILD School Sites seminar
- Brought together by 4-H Agent 
- Began sharing ideas & resources for school clubs


## PROJECTS OF NOTE

- Community bird festival
- National Public Lands Day at schools
- Recycling at school
- Earth Day events and activities
- Incubators into the schools
- 4-H Green School News




## SHARED DREAMS

- Expand Environmental Education in schools
- Involve greater community
- Draw teachers outside
- Nature center in York County—South



## WHY *NEW DIRECTION*?

- Clubs' reach is limited
- Outdoor education lacking
- \$\$ Field Trip budget cuts



## WHY...Us? *INFORMAL EDUCATORS*

- Comfortable teaching outdoors
- Experience with hands-on education
- Solid relationship with schools
- Outside funding for pilot
- Topic flexibility



## WHO IS BEST AUDIENCE FOR OUR *PILOT PROGRAM*?

- Comfort zone = elementary school education
- School's proximity to undeveloped land
- Sought out teacher *most likely to be* receptive
- Targeted event to grade level of selected teacher



## WHAT TOPIC(S)? *WHAT DO TEACHERS WANT?*

- Ask teachers
  - Which science SOLs might benefit most from a fresh hands on approach?
- Classroom time at premium
- Pilot = “oceans” unit  
...*Out of our comfort zone...*



## WHAT FORMAT?

### *FINDING OUR WAY*

- Sought: mini-grants with quick turnaround
- First proposal = multiple class visits
  - Moving too fast
  - Ditched first proposal & grant
- Retooled into field trip, larger grant



## WHY *A FIELD TRIP*?

- Reach an entire grade level
- One-day event
  - Minimize “classroom disruption”
  - Efficient use of volunteer time
- Suitable and sufficient space
  - Open and forested land
  - Next to one of “our” schools



## SELLING THE PROPOSAL

- SOL ties “get foot in the door”
- Focused grant application
- Presentation to Principal and Teachers
- Plowing ahead with no money
- What have we gotten ourselves into???



## HOW WILL IT WORK?

### FIELD TRIP SPECIFICATIONS

- Where?
- When & How Long?
- What?
- How?



## WHERE?

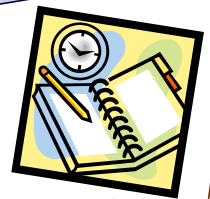
### 3 ADJOINING PROPERTIES

- School Grounds
- County Property
- Donated Land



## WHEN?

- Date?
  - **Before** SOL Testing
  - **After** teachers finish oceans unit
- Timing?
  - Duration = traditional field trip
  - **Before** lunch



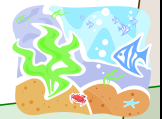
## HOW WILL WE KEEP STUDENTS ENGAGED?

- Minimize lecture
- Maximize hands-on
- Variety
- Ask them questions
- Journal



## WHAT ACTIVITIES?

- Target SOL topics
- Research!!
- Adaptable?
- Material availability & cost
- Specialized staffing?
- Testing & Review



## HOW CAN WE AFFORD THIS?

### FUNDING SOURCES

- School & VCE
- Donations
- Personal supplies
- Dual material lists
- Grant!



## WHO MIGHT HELP?

### EVENT STAFFING

- Our groups
- Environmental groups
- County/state agencies
- Retired teachers/professors
- Friends & Family!



## HOW DID OUR TEAM

### COORDINATE EFFORTS?

- Identify, divide, and conquer
- Online document creation and editing  
– Buzzword
- Weekly status meetings
- Review with others



## A SMATTERING OF DETAILS

- Access to facilities  
– Restrooms, water
- Field trip staff  
– Lead time for recruiting experts  
– Communications with staff
- Allow time for permits & materials
- Plan for rain/wind/heat/cold



## PERMISSION, PERMITS, PRECAUTION

- Permission for educational use of property(ies)
- Permit for educational use of macroinvertebrates through VDGIF Wildlife Biologist
- Customized permission slips for students
- Pre-walk hazard check with professional
- Tick season!



## Flexibility



Persistence


**A Walk Through a Forested Wetland**

Water runoff flows out of this wetlands area and the SES schoolyard into Chisman Creek (river) out to the Chesapeake Bay (estuary) and onwards to the Atlantic Ocean.

**Tying the land to the ocean...  
Why we named the field trip,  
“Estuaries to Oceans”**



## HOW TO MANAGE TIME?



- 4 classes, 6 activities
- Time for instruction, activity, journal
- 4 themed stations
- (Total time in minutes - 15 minutes) / 4  
– Split stations = ½ block
- Parent chaperones track time

## HOW TO ORGANIZE?

### FOUR PRIMARY STATIONS

**Walk**

**Life**

**Water**

**GEO**

## SUBDIVIDED STATIONS

**Water**

**Water testing**

**Ocean Currents**

**Life**

**plankton races**

**Investigating nonvertebrates**

## SPLIT STATION


**Walk** same activity, two groups

### FASCINATING FOSSILS

**GEO**



Teachers split their classes in half in advance: Sharks & Rays

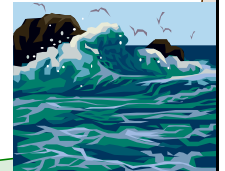


# Field Trip Schedule

Class A	Class B	Class C	Class D
9:15am Leave classroom and meet in SHARKS RACES	9:15am Leave classroom and meet in LIFE STATIONS	9:15am Leave classroom and meet in WATER STATIONS	9:15am Leave classroom and meet in WALK STATIONS
9:20am to 10:13am <b>WALK</b> Split in Teams for guided walk.	9:20am to 10:13am <b>GEO</b> Sharks to Plankton Races Rays to Plankton Races Sharks to Plankton Races Rays to Plankton Races	9:20am to 10:13am <b>LIFE</b> Sharks to Plankton Races Rays to Plankton Races Sharks to Plankton Races Rays to Plankton Races	9:20am to 10:13am <b>WATER</b> Sharks to Water Testing Rays to Water Testing Sharks to Water Testing Rays to Water Testing
10:15am to 10:40am <b>WATER</b> Sharks to Water Testing Rays to Water Testing Sharks to Water Testing Rays to Water Testing	10:15am to 10:40am <b>WALK</b> Split in Teams for guided walk.	10:15am to 10:40am <b>GEO</b> Sharks to Plankton Races Rays to Plankton Races Sharks to Plankton Races Rays to Plankton Races	10:15am to 10:40am <b>LIFE</b> Sharks to Plankton Races Rays to Plankton Races Sharks to Plankton Races Rays to Plankton Races
10:42am to 11:05am <b>WATER</b> Sharks to Water Testing Rays to Water Testing Sharks to Water Testing Rays to Water Testing	10:42am to 11:05am <b>WALK</b> Split in Teams for guided walk.	10:42am to 11:05am <b>GEO</b> Sharks to Plankton Races Rays to Plankton Races Sharks to Plankton Races Rays to Plankton Races	10:42am to 11:05am <b>LIFE</b> Sharks to Plankton Races Rays to Plankton Races Sharks to Plankton Races Rays to Plankton Races
11:10am to 11:36am <b>LIFE</b> Sharks to Plankton Races Rays to Plankton Races Sharks to Plankton Races Rays to Plankton Races	11:10am to 11:36am <b>WATER</b> Sharks to Water Testing Rays to Water Testing Sharks to Water Testing Rays to Water Testing	11:10am to 11:36am <b>WALK</b> Split in Teams for guided walk.	11:10am to 11:36am <b>GEO</b> Sharks to Plankton Races Rays to Plankton Races Sharks to Plankton Races Rays to Plankton Races
11:38am to 12:03pm <b>LIFE</b> Sharks to Plankton Races Rays to Plankton Races Sharks to Plankton Races Rays to Plankton Races	11:38am to 12:03pm <b>WATER</b> Sharks to Water Testing Rays to Water Testing Sharks to Water Testing Rays to Water Testing	11:38am to 12:03pm <b>WALK</b> Split in Teams for guided walk.	11:38am to 12:03pm <b>GEO</b> Sharks to Plankton Races Rays to Plankton Races Sharks to Plankton Races Rays to Plankton Races
12:05pm to 1:00pm <b>GEO</b> Sharks to Plankton Races Rays to Plankton Races Sharks to Plankton Races Rays to Plankton Races	12:05pm to 1:00pm <b>LIFE</b> Sharks to Plankton Races Rays to Plankton Races Sharks to Plankton Races Rays to Plankton Races	12:05pm to 1:00pm <b>WATER</b> Sharks to Water Testing Rays to Water Testing Sharks to Water Testing Rays to Water Testing	12:05pm to 1:00pm <b>WALK</b> Split in Teams for guided walk.

## Physical Layout of Stations

- Advance site visit with team
  - Station locations
  - Visualize transitions
- Station signs
- Minimize furniture



## Customized Field Trip Journal

- Students were given journals, pencils, and tote bags at their first station
- Each activity got a two-page spread

## Walk

**Guided Walk Through Forested Wetlands**

Illustrate and describe what you see on your walk.

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## Water

### WATER Quality Indicators, Testing

Record your water test data below.

Indicator Tested	Bucket Number	Findings
Dissolved Oxygen		
Dissolved Oxygen		
pH		
pH		
Salinity		
Salinity		

What are some other water quality indicators that scientists use to monitor the health of a body of water?

### WATER Testing--Related Questions

Why is water quality monitoring important?

**Dissolved Oxygen**  
What is dissolved oxygen?

Why is it important?

Why would dissolved oxygen levels be the highest in the afternoon and the lowest right before sunrise?

**pH**  
What is pH?

What happens at pH levels above 9.8 or below 4.5?

Water that has more H<sup>+</sup> ions than OH<sup>-</sup> ions is considered ?

Water that has more OH<sup>-</sup> ions than H<sup>+</sup> ions is considered?

**Salinity**  
What is salinity?

How is it measured?



## Water

### Investigating WATER Currents

**Surface Currents Activity**  
What happened to the water when the wind blew?

What happened to the water when the wind stopped blowing?

What happened to the floating balls when the wind blew?

What happened to the sunken balls when the wind blew?

**Currents Activity #1 Fresh vs. Salty**  
What happened when the small container of fresh water was added to the larger container of salty water?

What happened when the small container of salty water was added to the larger container of fresh water?

**Currents Activity #2 Temperature Variations**  
What happened when the cold water was added to the warm water?

What would happen if the warm water had a higher salinity level?

### Ocean Currents--Related Questions

**Surface Currents Activity**  
Are warm and currents the same?

**Currents Activity #1 Fresh vs. Salty**  
Is saltwater higher or lower in density than freshwater?

Is hot water higher or lower in density than cold water?

Where in natural ecosystems do we find saltwater and freshwater mixing or layering?

**Currents Activity #2 Temperature Variations**  
How does this simulate a natural ecosystem?

Where in natural ecosystems do we find cold water and warm water mixing or layering?





## Life

### LIFE Underwater Ocean Plankton

"Plankton" comes from the Greek word *plankein* for "drifting".

**plankton** = single organism **plankton** = plural form

**phytoplankton** = plants

**zooplankton** = animals  
(with this word, zoo-rhymes with Joe)

Phytoplankton must receive enough sunlight to photosynthesize. Only 1% of sunlight reaches 660 feet below the ocean surface.

Phytoplankton must stay in the sunlit zone to survive. However, if they are too close to the surface, photosynthesis is less efficient.

What adaptations allow phytoplankton or zooplankton to slow their sink rates?

*Fun with*

Zooplankton feed on phytoplankton and other zooplankton, so they must stay within reach of the phytoplankton. While they also drift with the ocean currents, zooplankton are able to travel vertically up and down the water column. Many only migrate up to the surface to feed at night when predators are fewer.

### Phytoplankton Races

Did your plankton sink during its first test? Yes No

If not, what did you have to do to get it to sink?

Did your plankton float for a bit before sinking? Yes No

If yes, about how many seconds did it float first?

How much time did it take for your plankton to sink to the bottom of the compression tank?

If you had more time, how might you have changed how your plankton was designed so that it would sink more slowly?

In which ways are these plankton races NOT a true scientific experiment?

## Life

### LIFE Underwater Macroinvertebrates!

Invertebrates: animals without internal skeletons  
Macroinvertebrates: no internal skeleton and can be seen without magnification.

One reason to study aquatic macroinvertebrates is that they provide information about **water quality** over a long period of time. Some macroinvertebrates are quite sensitive to polluted water and will not survive, while others can tolerate some level of pollution.

A **dichotomous key** can be used to identify which macroinvertebrates are in your sample.

A dichotomous key starts with a question and sends you to another question based on your answer.

Look at a macroinvertebrate in your water sample.

Here are just a few questions you might need to answer as you use a dichotomous key for stream macroinvertebrates.

Does it have segmented legs?


If yes, how many legs?

Does it have developed wings?

Is the body longer than it is wide or wider than it is long?

Is the body oval and flat with head & legs concealed?

### Draw a picture below of one or two macroinvertebrates you find in your investigation.



## GEO

### GEO Station Ocean Geology

Trace your fossil here and illustrate it.

## REVIEW & REFLECT

### FIELD TRIP FOLLOW-UP

#### Estuaries to Oceans Field Trip—Teacher's Evaluation Form

Use this form to evaluate the field trip. It is designed to be used by the teacher who led the field trip. It is not to be used by the students. It is not to be used by the students. It is not to be used by the students.

1. General Field Trip Information

Field Trip Name	Field Trip Date	Field Trip Location
Field Trip Leader	Field Trip Co-Leader	Field Trip Sponsor
Field Trip Budget	Field Trip Expenses	Field Trip Revenue

2. Field Trip Objectives

Field Trip Objectives	Field Trip Objectives	Field Trip Objectives
Field Trip Objectives	Field Trip Objectives	Field Trip Objectives
Field Trip Objectives	Field Trip Objectives	Field Trip Objectives

3. Field Trip Evaluation

Field Trip Evaluation	Field Trip Evaluation	Field Trip Evaluation
Field Trip Evaluation	Field Trip Evaluation	Field Trip Evaluation
Field Trip Evaluation	Field Trip Evaluation	Field Trip Evaluation

4. Field Trip Reflection

Field Trip Reflection	Field Trip Reflection	Field Trip Reflection
Field Trip Reflection	Field Trip Reflection	Field Trip Reflection
Field Trip Reflection	Field Trip Reflection	Field Trip Reflection

- Evaluations: required by grant and for our own use
  - One-page teacher feedback
  - Student journals
- Slideshow for the students

# Questions?

## You are now a Fifth Grader on the 4-H "Estuaries to Oceans" Field Trip...